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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,062	06/28/2001	Hong-Kyu Kim	8836-136 (IB10137-US)	5463

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EXAMINER

LANEAU, RONALD

ART UNIT	PAPER NUMBER
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2674

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/894,062

Applicant(s)

KIM ET AL.

Examiner

Ronald Laneau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/29/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7, 8 and 15 is/are rejected.
- 7) ☒ Claim(s) 4-6, 9-14, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

1. The amendment filed on 1/29/04 has been entered. New claims 15-17 are added and claims 1-17 are now pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 7, 8, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al (US 6,288,698) in view of Kim (US 6,348,909).

As per claims 1 and 7, Ishii et al teach a liquid crystal display (LCD) controller 10 generating control signals for displaying in response to pixel data to display pictures on a liquid crystal panel having a plurality of pixels comprising a dithering pattern register section for

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storing binary data of gray levels, wherein a certain number of gray levels have a same bit number as denominator values of certain number of gray levels (col. 4, lines 1-5 and 48-64, figs. 6A, 6B); multiplexers for generating data patterns for the respective gray levels in accordance with an output of the respective modular register counters; and a selection means 13 for selecting and generating a corresponding bit of a data pattern corresponding to the pixel data provided on a LCD panel among the data patterns (col. 5, lines 14-30). Ishii et al do not teach modular register counters for performing counting operation to determine a binary value of most significant bit of each of the gray levels in response to a frame clock, a line clock, and a pixel clock but Kim teaches a gray-scale lcd driver comprising a data storing section 10 for storing n bits of digital data assigned for producing a gray-level in synchronization with a clock signal CLK of a register, a counter 20 for generating counting data supplied from the counter and outputting a comparing signal Comp if the digital data are equal to the counting data (col. 5, lines 5-15). The counter 20 is equivalent to the modular register counter claimed by applicant.

It would have been obvious to one of ordinary skill in the art to utilize the pixel counter as taught by Kim into the device of Ishii et al because it would provide great accuracy in determining the bit values and at the same time improve the display quality.

As per claim 8, this is a method claim corresponding to the apparatus of claim 1 and is therefore rejected on the same basis as claim 1.

As per claim 15, Ishii et al teach an LCD controller have a dithering pattern for storing binary data of a gray level having a denominator value. Ishii et al do expressly teach a denominator value of "7" but it would have been obvious to one of ordinary skill in the art to utilize a denominator value of "7" as claimed for the same reasons given in claim 1.

5. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over as being unpatentable over Ishii et al (US 6,288,698) in view of Weise et al (US 5,638,187).

As per claim 2, Ishii et al do not teach a liquid crystal display controller wherein the dithering pattern register section forms dithering patterns by dividing the gray levels into groups each having a same denominator value but Weise et al teach a system for displaying color on a computer using dithering techniques by dividing the area of the color display to be filled with an application-specified RGB value into 8-by-8 groups which would obviously make the denominator value to be 8 for all patterns (col. 4, lines 56-61).

It would have been obvious to one of ordinary skill in the art to utilize the dithering pattern techniques taught by Weise into the device of Ishii et al because it would a system and method for generating a dither pattern that is a close approximation of a specified color (col. 3, lines 8-10).

As per claim 3 Ishii et al teach a liquid crystal display controller wherein the dithering pattern register section is programmed to store the binary data as much as duty cycles for the respective gray levels using predetermined numbers as denominator values of the gray levels (col. 4, lines 11-17).

Allowable Subject Matter

6. Claims 4-6 and 9-14 are objected for the same reasons given in previous action.

Claims 16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As per claims 16 and 17, an LCD controller wherein the dithering pattern register section further comprises:

a second, a third, and a fourth dithering pattern register each for storing binary data of a gray level having a denominator value.

Response to Arguments

7. Applicant's arguments filed on 01/29/04 have been fully considered but they are not persuasive.

Applicant argues that Ishii does not teach dithering patterns that are stored in a dithering pattern register and/or registers having the same bit denominator value but contrary to applicant's arguments, Ishii et al teach a dither logic 10 seen in figure 1A that is capable of storing binary data of a gray level having a denominator value as claimed. Applicant's arguments about Hinman are moot in view of the newly added reference (Kim US 6,348,909). As far as the arguments about Weise, the dither pattern taught by Weise is capable of forming dithering patterns using the same bit number as the gray level of the denominator value as claimed contrary to applicant's arguments. Therefore, the rejection stands.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronald Laneau whose telephone number is 703-305-3973. The examiner can normally be reached on Monday-Thursday from 8:00 AM to 6:00 PM or via email: ronald.laneau@uspto.gov.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Hjerpe can be reached at 703-305-4709.

9. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Ronald Laneau
Examiner
Art Unit 2674

rl
March 15, 2004



RICHARD HJERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600